

Claims

1. A method of fastening a first curved part to a second curved part comprising:

- (a) placing the second part into a specified orientation in relation to a robotically controlled tape applicator;
- (b) applying two-sided adhesive tape along a non-linear path over the surface of the second part;
- (c) placing the first part into registry with the second part to adhere to the adhesive tape.

2. The method of Claim 1, further comprising applying a liquid activator over the surface of the first part along the path over which the tape is to be applied, prior to applying the tape.

3. The method of Claim 2, wherein the liquid activator is applied with a robotically controlled activator applicator.

4. The method of Claim 3, wherein the activator applicator forms part of the tape applicator.

5. A robotic tape applicator comprising:

(d) computer means;

(e) tape applicator means under the control of the computer means; and

(f) means to hold a work piece in registration with the tape applicator means;

such that when the computer means is programmed with data respecting the shape of the work piece and the proposed path of the tape to be adhered to the work piece, the tape applicator means is adapted to apply the tape to the work piece along said path.

6. The robotic tape applicator of Claim 5, further comprising activator applicator means adapted to apply an activator liquid along the predetermined path prior to application of the tape.

7. The robotic tape applicator of Claim 5, wherein the tape applicator means comprises:

(a) a tape applicator head;

(b) cutting means to cut the tape; and

(c) tape braking means adapted to hold the tape stationary during cutting.

8. A robotic tape applicator comprising:

(a) a computer adapted to control a robotic arm according to a program;

(b) the robotic arm comprising:

(i) a roller adapted to releasably store two-sided adhesive tape;

(ii) guide means to guide the tape to a tape applicator head for application to a work piece;

(iii) the tape applicator head comprising a nose biased to permit reciprocal motion in a direction normal to the work piece; and

(iv) cutting means integral with the tape applicator head, adapted to cut the tape under the control of the computer.

9. The robotic tape applicator of Claim 8, further comprising tensioning means located between the roller and the nose adapted to maintain a uniform tension.

10. The robotic tape applicator of Claim 9, wherein the tensioning means comprises a nip roller.

11. The robotic tape applicator of Claim 8, further comprising braking means adapted to releasably restrain movement of the tape.

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12. The robotic tape applicator of Claim 11, wherein the braking means comprises a spring biased lever adapted to releasably trap the tape.
 13. The robotic tape applicator of Claim 12, wherein the spring-biased lever is adapted to release the tape under pneumatic pressure.
 14. The robotic tape applicator of Claim 8, wherein projections located on either side of the nose and extending beyond the leading edge of the nose a distance less than the thickness of the tape are adapted to contact the work piece while the tape is running between said projections to uniformly compress the tape during tape application.
 15. The robotic tape applicator of Claim 8, wherein a hydraulically or pneumatically controlled piston in a compliance cylinder is adapted to maintain a constant pressure on the tape applicator head.
 16. The robotic tape applicator of Claim 8, wherein the cutting means comprises a knife blade located within the perimeter of the tape applicator head when the cutting means is not in operation.
 17. The robotic tape applicator of Claim 16, further comprising a pneumatic or hydraulic blade control piston to control the knife blade operation.
 18. The robotic tape applicator of Claim 16, further comprising a knife blade sensor adapted to detect when the knife blade is fully retracted after the tape is cut and to signal the computer so that tape application can resume.

19. The robotic tape applicator of Claim 8, further comprising vacuum ports adapted to provide sites of negative pressure against which the tape can be slideably held during application of tape to the work piece.

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20. The robotic tape applicator of Claim 8, wherein the nose of the tape applicator head comprises a smooth radius, the centre point of which radius lies along a roll axis of the robotic arm.

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